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BASIL L. GILDERSLEEVE

CONTENTS.

II.—THE INDO-EUROPEAN PALATALS IN SANSKRIT.

1. The Indic and the Iranian languages differ greatly in their treatment of the IE. stopped consonants. We are struck by the frequent change of stops to spirants in Iranian, as opposed to the conservative " history, in this respect, of the Sanskrit. The former is a spirantizing language, like the old Germanic.

Thus the Iranian shows us spirants for the IE. aspirated voiceless stops, as in Av. *paθ-a* O. P. *paθi-m* (Sk. *path- pathi-*), and for the IE. voiceless stops before consonants, as in Av. *āfš* (Sk. *áp*), *suxra-* O. P. *θuxra-* (Sk. *s'ukrá-s*), Av. *θwąm* O. P. *θ(u)wam* (Sk. *tvám*).[1]

The Younger Avestan, moreover, shows us spirants for the IE. aspirated and simple voiced stops, as in *aⁱwi* (Sk. *abhí*) *and* *γᵊnā* (Sk. *gnā̃*). We may note also such YAv. double spirants as in *uxδa-* (Sk. *ukthá-m*) and *vaxᵊδra-* (Sk. *vaktrá-m*).

2. To recall these well-known facts would be, strictly speaking, sufficient for our purposes in the present discussion: it may, however, be instructive to consider briefly what physiological causes probably brought about these changes of pronunciation in Iranian and Younger Avestan.

The spirantizing of voiceless aspirates in Iranian is parallel to that in Germanic, and may like the latter be attributed to a pronunciation with *increased stress of breath*. Cf. especially H. Meyer, Z. f. d. Alt. 45, 101 ff. The agreement of Iranian and Germanic in not spirantizing these sounds after a spirant, as in Av. *spara-ṭ* (Sk. *sphurá-ti*) is significant not only of a like cause for the Iranian and the Germanic phenomena, but also of this particular cause: for the utterance of a preceding spirant, in requiring a comparatively great volume of breath, lessens the breath stress for the following stop and so prevents spirantiza-

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[1] As constant reference to an often divergent set of views might prove confusing, we may here refer once for all to the treatment of the IE. palatals in Aryan in Brugmann's Grundriss I², §§ 610–618. 714–720. 1007, 12, which has been looked upon as the standard view of the subject. All examples are taken from the Grundriss and from Whitney's Sanskrit Grammar³, §§ 142. 145–147. 214–224, c. 612, d. 617, b. 832, a. 833, a. 890, a.

tion. Similarly in E. *ten* we pronounce an aspirated fortis, *ten* or *then*, but in E. *step* a simple fortis or voiceless lenis, *step* or *sdep*. So also G. *tut* vs. *Stute*, Dan. *Time* vs. *Stime*; and it is conceivable that the very great breath stress of Dan. *Time* may in time produce ϴ*ime* while the *t* in *Stime* would be retained as a stop.

The similar retention of the stop after nasals in Iranian, as in Av. *pantå* (Sk. *pánthā-s*) is an indication that breath stress was weaker here than in Germanic, where spirantization took place in spite of the escape of breath in a preceding nasal. Another indication of such a difference between Iranian and Germanic is the retention in Iranian of voiceless unaspirated stops. The general increase of breath stress in Iranian was sufficient to make spirants of voiceless stops followed by aspiration (with open glottis), but not of voiceless stops immediately followed by closing of the vocal chords for a vowel, as in Av. *pita* O. P. *pitā* (Sk. *pitå*). Before a consonant, however, where the closing of the vocal chords was not so immediate, spirantization took place, as in the examples above given. This is an illustration of the familiar fact that the utterance of a voiceless sound, i. e., of one with open position of the glottis, involves the passing through the mouth of far more breath than the utterance of a voiced sound, during which the vocal chords are closed and allow breath to pass only in the interstices of their vibration,—compare the well-known experiment of trying to blow out a candle first with a voiced, then with a voiceless sound.

Thus we may perhaps also explain the fact that the voiced stops became voiceless in Germanic, but in Iranian, where the breath stress was weaker, remained sonant. This is for various reasons a most doubtful matter, as is also the spirantizing of the voiced aspirates in Germanic; suffice it therefore to note that in Germanic both these classes of sounds were changed to sounds requiring more breath for utterance, whereas in Iranian this was not the case, aspirate and simple sonant stops here coinciding, most probably as simple sonant stops.

A different explanation is necessary for the phenomena of Younger Avestan. Here the Iranian voiced stops became voiced spirants. Increased breath stress alone would probably have turned these sounds into voiceless stops, as in Germanic and later in High German and Danish; it seems rather as if in the Younger Avestan *looseness of articulation* were involved. This

is surely the case where Younger Avestan changed Iran. *ft χt* to *fδ xδ*, as in *uxδa-* and *vax³δra-*. Such groups as *ft χt* can be conveniently pronounced with any degree or increase of breath stress; they are stable in such highly stressed languages as English, German, and Danish. The YAv. change to double spirants is a decided sign of loose articulation of stops.

3. It is probable, then, that the Iranian dialects diverged from the Sanskrit in being spoken with increased breath stress, and that the Younger Avestan further differed in loosely articulating its stops. However this may be, it is certain that the Iranian languages differed from the Sanskrit in *tending toward spirant pronunciation of stopped consonants*, and that this is especially true of the Younger Avestan. In the following pages, whenever mention is made of the "stronger breath stress of the Iranian" or "looser articulation of the Avestan", the empirical reader will always be able to substitute the words "more spirant pronunciation" without in any way affecting the argument. To what extent the greater conservatism of Sanskrit is due to the greater antiquity of the language in our records need not here concern us: the nature of the divergence between early Iranian and Sanskrit as we know them is all that will affect our present considerations.[1]

4. This difference between the phonetic character of Iranian and Sanskrit may help us to understand the differing development of the IE. palatals in the two languages. We should first have to form a hypothesis, however, as to the character of these sounds in Indo-European, were it not that the opinion of Brugmann (Gr. I², § 543 and K. Vgl. Gr. § 157) has found general acceptance. Brugmann's view is that the stop-articulation of these sounds is the more original; that they were in Indo-European slightly palatalized *k*-sounds (*k' k'h g' g'h*) which in the development of the so-called *centum* languages were not distinguished from simple velar consonants, but in the eastern (*satəm*) languages became sibilants. Phonetic parallels are of course in favor of this view, for the gradual change of slightly palatalized velars to sibilants is a familiar phenomenon. A palatalized velar *k' g'* is pronounced as a simple stop articulated somewhat farther forward in the mouth than a plain velar (French

[1] In the above and following paragraphs theorizing as to the nature of the IE. voiced aspirate stops has been avoided,—or rather, it has been relegated from here to a note at the end of these remarks.

dialects, Norwegian dialects, Lithuanian, modern Slavic languages, Magyar).[1] Articulation of the middle tongue against the higher parts of the palate is not so rapid or precise as in other parts of the mouth. Especially as the removal of the tongue after the stop is not so quick as after a velar or dental, the resulting acoustic effect resembles an affricate,—the stop being followed by the sound of the breath passing between the palate and the tongue ($k' > k'h > k'\chi'$). Cf. Brugmann Gr. I[2], § 47, 1. Meanwhile the point of articulation passes forward, approaching that of dental consonants ($k'\chi' > t'\acute{s}'$), as in Old French (*ch*, *g*), English, Norwegian, Swedish, Slavic languages. In some languages, which tend to articulate either with the back or with the tip of the tongue and not with intermediate points, the palatal character of $t'\acute{s}'$, $d'\acute{z}'$ may be nearly or wholly given up, the result resembling $t\check{s}$, $d\check{z}$, as in Italian and English. Where the palatal character is retained the stop grows less and less close and is finally assimilated to the spirant : the result is a more or less palatal $\acute{s}'$, s, or $\check{s}$ sound, as in modern French (*c ch*, *g*), Italian dialects ($\acute{s}'$, $\check{z}'$, cf. Passy, Petite Phonétique Comparée, p. 85), Portuguese (*c*, *g*), and modern Slavic languages. As the reverse of this process is very rare—if indeed it be not inconceivable,— we must assume for the IE. palatals a pronunciation k' $k'h$ g' $g'h$. From this developed the sibilants of the *satəm* languages.

5. The standard view then supposes that in all the so-called *satəm* languages—and therefore in all Aryan and long before any distinction between Iranian and Indic—this development had uniformly taken place ; in other words, that any and all Iranian and Sanskrit representations of the IE. palatals are later forms of Ar. sibilants $\acute{s}'$ $\acute{s}'h$ $\acute{z}'$ $\acute{z}'h$ (before stops $\check{s}$ $\check{z}$, before sibilants χ γ).

This hypothesis does very well for the facts of Iranian, where the IE. palatals are everywhere pronounced as sibilants, e. g., Av. *vasō* O. P. *vasiy* (Gr. ἑκών), Av. *zī-zanāṯ* O. P. *vispa- z(a)na-* (Gr. γένος), Av. *hazah-* (Gr. ἔχω Goth. *sigis*),—as sibilants even in the combinations IE. $\hat{k}s$ $\hat{g}zh$, e. g., Av. *aša-* (Gr. ἄξων), Av. *uz-važaṯ* (Lat. *vexit*). We know, moreover, that these sibilants were well on in their development in the Aryan period, for the new palatals which in Aryan times developed from IE. velars and labiovelars before IE. front vowels did not coincide with the

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[1] An early stage is heard in the German pronunciation, e. g., of *Kind* as opposed to *Kalb* and *Kuchen*.

old IE. palatals, but remained as palatal stops or affricates č ǰ, as in Av. *čiṭ* O. P. *čiy* (Sk. *cid*), Av. *ǰvaiti* O. P. *ǰīvāhy* (Sk. *jīva-ti*). In other words: before the palatalization in Aryan times (earlier than IE. *ĕ ŏ > ă*) of IE. velars and labiovelars, the IE. palatals had developed so far that the new palatals never coincided with them—never "caught up" with them:—the IE. palatals had, we may safely say, developed into sibilants.

This, the standard view, is further supported when we consider the characteristics of Iranian mentioned in §§ 1–3. Strong breath stress (or at any rate spirant tendency) in pronouncing *k' g'* makes the spirant glide more noticeable than otherwise, so that the affricate stage is more quickly reached than where the breath stress is weaker. Strong breath stress (especially if combined with loose tongue articulation) hastens the weakening of the stop element and its assimilation to the spirant element. Iran. *s z* were somewhat palatal sibilants, cf. such spellings (or dialectic forms) as O. P. *a-θahaʰ* (Av. *saṃha te* Sk. *š'aṃsa-ti*), *ā-yadana-* (Av. *yazaite* Sk. *yájⁱa-tē*). The development of IE. *k̂s ĝzh* from *k'š g'žh* through more and more relaxed and spirant articulations to *š ž* is also natural; it is of little moment whether or not we assume an intermediate stage *χš γž*: some such thing there must have been.

6. When we come to the Sanskrit, however, we find the conditions—as indeed we might expect them—quite different. IE. *k̂* before vowels, semivowels, nasals, and *r* has, to be sure, gone through the development to the palatal sibilant *š'* as in *vaš'mi* (Gr. ἑκών); note especially the conversion of *s* before Sk. palatals to the same sound as in *tátaš' ca*.

Aside from this case (and one other), however, the facts differ greatly from those of Iranian. To begin with, IE. *ĝ* before vowels, semivowels, etc., has in early Sanskrit times the pronunciation of a simple voiced palatal *stop g'* or better *d'* (written *j* as in *jánas-*), coinciding with the *d'* developed in Aryan from IE. velars and labiovelars before IE. front vowels (as in *jīva-ti*). As to the character of this sound in early times, cf. Whitney, l. c., § 44, a and especially Brugmann, K. Vgl. Gr., § 22, 4, with references. As was inevitable, this sound came to assume a spirant glide (cf. § 4), but in classical times it never acquired the metrical value of a double consonant and was never considered otherwise than as a simple voiced *stop*. According to the standard view, now, this palatal stop is a development from an Ar. sibilant *ž'*—a

reversion, as it were, to an older state: IE. $\hat{g}$ ($= g'$) $>$ Ar. $\check{z}'$ $>$ Sk. j ($= d'$),—cf. for instance Brugmann, Gr. I², § 62, Anm. 2. Phonetically this is of course most unlikely,—just as it is unlikely that the *k*-sounds of the *centum* languages are derived from sibilants like those of the *satəm* languages, cf. § 4.

The same holds true of the IE. palatal voiced aspirate: in Sanskrit IE. $\hat{g}h$ and Ar. $g'h$ ($<$ IE. *gh gᵘh* before front vowels) are represented alike as *h*, e. g. *sáhas-* (Av. *hazah-* Goth. *sigis*) and *hán-ti* (Av. *jaⁱnti* Gr. θείνω). Here, indeed, it might be urged that the representation in Sanskrit of IE. $\hat{g}h>$ Ar. $\check{z}'h$ had not " reverted " so as to coincide with that of Ar. $g'h$, but that the two sounds never had coincided until they both became *h*;— in other words, that IE. $\hat{g}h$ $>$ Ar. $\check{z}'h>$ Sk. *h* and that Ar. $g'h>$ Sk. *h*. Unfortunately for the current view of this matter there is an obstacle to this assumption: the Sanskrit law of deaspiration, when operating on IE. $\hat{g}h$ leaves the usual representation of IE. *g*, namely *j* ($= d'$) as in *jáṅghā* ($<$ IE. *$\hat{g}heṅghā$, Goth. *gaggs*). Hence the current view of this subject is forced to assume that here too the Ar. sibilant $\check{z}'h$ acquired stop value in Sanskrit, that IE. $\hat{g}h$ ($= g'h$) $>$ Ar. $\check{z}'h$ $>$ Sk. *jh ($= d'h$) $>$ Sk. *h* or *j* ($= d'$). Moreover this return of the sibilant to stop value must have been very early, since Sanskrit deaspiration took place before the change of *zh* to *s*, *š*, cf. Brugmann, Gr. I², § 827.

Finally there are a few cases of IE. $s\widehat{k}(h)$, where we find these sounds represented by Sk. *(c)ch*, as in *chinát-ti* (Gr. σχίζω), *ducchúnā* (*du š + š' unā*). This *(c)ch* makes the preceding vowel " long by position " (Whitney, l. c., §§ 44, a. 227); it is also produced by the combination of *-t š'-* as in *tac chakyam* (*tat + š'akyam*): hence its character as a double sound, namely as a palatal affricate ($t'š'$) is plain. Note also the phonetic spelling *cš'*. Here again the standard view is forced to suppose that IE. $s\widehat{k}(h)$ ($= sk'(h)$) $>$ Ar. $š'š'(h)>$ Sk. *(c)ch* ($= t'š'$)—again a development contrary to the usual course of such sounds and to the course which such sounds had previously taken in the same language.

7. The current supposition, in short, is that the IE. palatals developed uniformly over the entire Aryan territory: that their spirantization and stop-loosening was as fast in the otherwise " conservative" Sanskrit territory as in the Iranian with its spirant tendency; that when Sanskrit and Iranian grew to be

separate languages the former as well as the latter pronounced
the IE. palatals as sibilants $\acute{s}'$ $\acute{s}'h$ $\acute{z}'$ $\acute{z}'h$.   The Sanskrit, however,—
repenting the precipitate course it had taken in company with the
Iranian,—changed $\acute{s}'\acute{s}'(h)$ ($<$ IE. $s\widehat{k}(h)$) back to $(c)ch$ ($= t'\acute{s}'$),
$\acute{z}'$ back to j ($= d'$), and $\acute{z}'h$ back to jh ($= d'h$, later d' or h),
leaving only $\acute{s}'$ at the end of the alphabet as a spirant,—a last
trace of the bad company and profligate habits of the past.

If we examine the actual forms of the Sanskrit language, how-
ever, we find nothing anomalous ; and if, in tracing the origin of
these forms and in comparing them to Iranian forms, we keep in
mind the physiologic aspect of the process of palatalization (out-
lined in § 4) and apply what we know about the difference
between Iranian and Sanskrit treatment of consonants (cf. §§ 1–3),
we shall probably find in the history of the IE. palatals in San-
skrit nothing unusual or surprising.   Beginning with the Indo-
European, we shall now try to reconstruct this history.

8. The IE. palatals $\widehat{k}$ kh $\widehat{g}$ $\widehat{g}h$ (probably pronounced k' $k'h$
g' $g'h$, cf. § 4) seem to have gone rapidly along the course of
palatalization in one part of the Aryan territory (in which other-
wise also spirant tendency later appears), namely in that dialect
which later became the Iranian language ; for, when the Ar.
velars ($<$ IE. velars and labiovelars) became palatal before front
vowels, these new palatals were in this dialect distinct from the
old palatals.[1]   At the end of the Aryan period then, the Iranian
started out with one set of more or less purely spirant palatal
sounds, say $\acute{s}'$ $\acute{s}'h$ $\acute{z}'$ $\acute{z}'h$, and one set of (new) palatal stops k' $k'h$
g' $g'h$.

The further history of the palatals in Iranian is clear (cf. § 5).
The old palatals, if not already pronounced as sibilants soon
reached this pronunciation.   Examples are :

(a) Av. s ($<$ IE. $\widehat{k}$): *vasō* O. P. *vasiy* (Gr. ἑκών).
   ($<$ IE. $s\widehat{k}$): *jasa^{i}ti* (Gr. βάσκε).
   ($<$ IE. $s\widehat{k}h$): *hi-siδyāṭ* (Gr. σχίζω).
   ($<$ IE. $\widehat{k}s\widehat{k}$): *pər^{ə}sa^{i}ti* ($<$ IE.* $p\underset{\circ}{r}\widehat{k}$-s$\widehat{k}$e-ti).
(b) Av. z ($<$ IE. $\widehat{g}$): *zī-zanaṭ* O. P. *vispa-z(a)na-*
              (Gr. γένος).
   ($<$ IE. $\widehat{g}h$): *hazah-* (Gr. ἔχω Goth. *sigis*).
   ($<$ IE. $z\widehat{g}h$): GAv. *zaē-mā* (Gr. σχοῖμεν).

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[1] This is much like the state of things in the Slavic languages, e. g. modern
Russian, where several degrees of palatalization coexist.

(c) Av. *š* (< IE. $\widehat{k}s$): *aša-* (Gr. ἄξων).

  (< IE. $\widehat{k}p$): *šiti-š* (Gr. κτίσις).

  (< IE. $\widehat{k}ph$): *rašō* (Gr. ἐρέχθω).

  (< IE. $\widehat{k}$-t): *vašti* (Gr. ἑκών).

  (< IE. $\widehat{k}$-q): *saškuš-təmō* (< IE.* $\widehat{k}e$- $\widehat{k}q$-)

(d) Av. *ž* (< IE. $\widehat{g}zh$): *uz-važat̤* (Lat. *vexit*).

  (< IE. $\widehat{g}$-d): *marəždikəm* (< IE.* $mr\overset{\circ}{\widehat{g}}$-$d$-).

  (< IE. $\widehat{g}$-dh): *važdri-š* (< IE.* $u\widehat{eg}h$-).

  (< IE. $\widehat{g}$-bh): GAv. *vīžⁱbyō* (dat. abl. pl. of *vīs-*).

The new palatals became *č* and *ǰ*, probably palatal affricates, except in positions where stops became spirant (cf. § 2). In such positions *š* and *ž* were spoken : the coincidence under these conditions with certain representations of the old palatals, (c) and (d) above, affords the best possible example of the connection between spirantizing tendencies and tendencies which accelerate palatalization. Examples :

(e) Av. *č* (< Ar. *k'*): *čit* O. P. *čiy* (Gr. τί).

(f) Av. *ǰ* (< Ar. *g'*): *ǰvaⁱti* O. P. *ǰīvāhy* (Gr. δίαιτα).

  (< Ar. *g'h*): *ǰaⁱnti* O. P. *a-ǰanam* (Gr. θείνω).

(c) Av. *š* (< Ar. *k'*): GAv. *vašyetē* (Gr. ἔπος).

(d) Av. *ž* (< Ar. *g'*): *dažaⁱti* (Goth. *dags*, Lith. *degù*).

  (< Ar. *g'h*): *snaēžaⁱti* (Gr. νίφ-α).

9. In that dialect of Aryan which later became the Indic language the spirantizing tendency of usual speech was less than in the sister dialect. Consequently palatalization proceeded much less rapidly.

In the utterance of unvoiced sounds, where the glottis is open, more breath is passed through the mouth than in the utterance of voiced sounds.[1] Unvoiced palatal stops, therefore, are more susceptible to affrication and spirantization than voiced stops. In a language where the breath stress is at all strong—strong enough to develop even a voiced palatal with some rapidity— this difference does not show itself; in the early history of Sanskrit, however, we must ascribe to it the more rapid development of IE. $\widehat{k}$ ($\widehat{k}h$) as compared to $\widehat{g}$ $\widehat{g}h$.[2]

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[1] Cf. the candle experiment cited in § 2.

[2] Similarly perhaps F. *ciel* (< Lat. *caelum*), but *gendre* (< Lat. *gener*), with *s* and *ž*. French breath stress is decidedly weak.

As a consequence of this more rapid development of IE. $\widehat{k}$ it came about that when the new Aryan palatals developed from velars before front vowels, the IE. *unvoiced* $\widehat{k}$ was already well along toward spirantization, but the IE. *voiced* palatals $\widehat{g}$ $\widehat{g}h$ were still stops and accordingly coincided with the new voiced palatal stops Ar. g' $g'h$.

In the combinations IE. $s\widehat{k}$ and $s\widehat{k}h$ the IE. palatal did not develop so rapidly as in independent $\widehat{k}$ because the preceding *s* here lessened the breath stress for the following $\widehat{k}$ $\widehat{k}h$, cf. § 2. The *s* was assimilated to the following palatal, becoming a palatal sibilant,—cf. the similar change later in Sanskrit, as in *tataš′ ca* from *tatas + ca*. Thus IE. $s\widehat{k}'(h)$ ($= sk'(h)$) became $šk'h>$ $š'k'χ' > š't'š'$ which was then simplified to $t'š'$ [1]—written (*c*)*ch* and pronounced as a prolonged t' plus decided spirant glide, cf. *tac chakyam* in later times from *tat + š′akyam* (§ 6), but *tac ca* pronounced *tat′-t′a* (with much slighter glide) and written without the *h*, from *tat + ca*—the *c* in *ca* being t' with a slight glide. IE. $s\widehat{k}$ also occurs in the compounds *ducchinā* (*duš + š′unā*) and *párucchēpa* (*paruš + š′ēpa*).—IE. $\widehat{k}s\widehat{k}$ either became $s\widehat{k}$ as in Latin *posco* (Brugmann, Gr. I², § 707, Anm.); or, if this change is not to be assumed for Aryan, it became $\widehat{k}\widehat{k}$ where the lengthened tongue pressure incident to articulation of a double stop preserved the stop value, giving Sk. $t'š'$, ((*c*)*ch*), cf. below.

What has been said in the last three paragraphs applies to the IE. palatals before vowels, semivowels, nasals, and *r*. In these positions, then, Sanskrit possessed at the end of the Aryan period the following sounds: unvoiced: $š'$, $t'š'$, k' (Ar. palatal); voiced: g' (IE. palatal and Ar. palatal), $g'h$ (IE. palatal and Ar. palatal), $g'g'$ (Ar. palatal, from older zg').

These sounds suffered little change in Sanskrit. In historic times $š'$ had reached palatal sibilant pronunciation. $t'š'$ written (*c*)*ch* was a palatal affricate: both $t'š'$ as well as k' g' $g'h$ $g'g'$ were spoken with the front rather than the middle of the tongue ; the latter set of sounds early added a spirant glide, and were later different from the dentals scarcely in any respect but this. We write t' (Sk. *c*), d' (Sk. *j*), $d'h$ (Sk. *jh > j, h*), $d'd'$ (Sk. *jj*). As for his last sound : it in no case represents an IE. palatal,

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[1] For an analogous simplification, cf. prim. Slavic *štš′* > Slov. and Russ. *t′š′* (as in *sveča*), Brugmann, Gr. I², § 316, Anm. 2. Cf. also Sk. *vr̥kši* < **vr̥škši*, *š′ikša-ti* < **š′iškša-ti*.

but always Ar. *zg′*, which developed like IE. *s$\widehat{k}$*, except that in the voiced sound the final spirant glide was less noticeable. Hence the parallelism of Ar. *zg′* > Sk. *d′d′* with Sk. *cc* rather than *(c)ch*. Cf. also *taj jalam* for *tad + jalam*. Where *d′h* was not deaspirated the voiced stop element was lost, leaving voiced *h*.[1] Thus, in the positions named, the Sanskrit spoke:

(a) Sk. *š′* (< IE. *$\widehat{k}$*): *váš′mi* (Gr. ἑκών).
(b) Sk. *(c)ch* (pr. *t′š′*, < IE. *s$\widehat{k}$*): *gáccha-ti* (Gr. βάσκε).
    (< IE. *s$\widehat{k}$h*): *chinát-ti* (Gr. σχίζω).
    (< IE. *$\widehat{k}$s$\widehat{k}$*): *pṛcchá-ti* (< IE. **pṛ$\widehat{k}$-s$\widehat{k}$e-ti*).
(c) Sk. *j* (pr. *d′*, < IE. *$\widehat{g}$*): *jánas-* (Gr. γένος).
    (< IE. *$\widehat{g}$h*): *jáṅghā* (Goth. *gaggs*).
    (< Ar. *g′*): *jíva-ti* (Gr. δίαιτα).
    (< Ar. *g′h*): *ja-ghána* (Gr. θείνω, ἔ-πεφνον).
(d) Sk. *h* (voiced sound, < IE. *$\widehat{g}$h*): *sáhas-* (Gr. ἔχω,
                Goth. *sigis*).
    (< Ar. *g′h*): *hán-ti* (Gr. θείνω).
(e) Sk. *c* (pr. *t′*, < Ar. *k′*): *ci-d* (Gr. τὶ).
(f) Sk. *jj* (pr. *d′d′*, < Ar. *zg′*): *májja-ti* (Lith. *mazgóti*).

10. Before sibilants the IE. palatals *$\widehat{k}$ $\widehat{g}$* appear in Sanskrit as *k*. Even here IE. *$\widehat{k}$ $\widehat{g}$* must in Aryan times have possessed some palatalization, though much less than in the same combination in the Iranian part of the territory. We may suppose that IE. *$\widehat{k}$s* was in pre-Indic *k′š*. Whatever spirant glide may have followed *k′* was of course lost in the sound of the *š*: as the palatalization of the *k′* was thus scarcely noticeable, the combination was finally pronounced *kṣ*, coinciding with *kṣ* < IE. *qs, qᵘs*.

The combination IE. *$\widehat{g}$zh* is also found in Sanskrit as *kṣ*. Now voiced sibilants (except for the sibilant glide of *d′* or *d′d′*) were not pronounced in Sanskrit, but were lost. We may suppose that the Sanskrit breath stress was too weak ·to enounce a sibilant with closed glottis—of this more below. In Sanskrit pronunciation, then, *zh* would have been lost. We must therefore ascribe the change of IE. *zh* to *š* to a pre-Sanskrit stage—perhaps to a dialectic change in the Aryan period. In this, Sanskrit resembles Celtic and Germanic, in which also the normal processes of the language acted on a basis of pre-Celt. and pre-Germ.

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[1] This pronunciation will be spoken of in the note on the IE. sonant aspirates.

ks ts ps and not *gzh dzh bzh* (cf. Brugmann, Gr. I², §§ 766, 2. 796, b. 827). It is worth noting also that the Iranian alone has preserved the combinations in question as voiced sounds. In Sanskrit, then, IE. $\widehat{g}zh > k's$ (for "aspiration" attached to a voiceless *s* sound means nothing) $> k\underset{.}{s}$. Examples:

(g) Sk. $k\underset{.}{s}$ ($< $ IE. $\widehat{k}s$) : *ákṣa-s* (Gr. ἄξων).

($<$ IE. $\widehat{k}p$) : *kṣiti-ṣ* (Gr. κτίσις).

($<$ IE. $\widehat{k}ph$) : *rákṣas-* Gr. ἐρέχθω).

($<$ IE. $\widehat{g}zh$): *a-vākṣīt* (Lat. *vexit*).

($<$ IE. $\widehat{g}dh$): *kṣam-* (Gr. χθών).

11. The statements in the preceding § do not apply to IE. $\widehat{k}$ $\widehat{g}$ + sibilant *before stops* (i. e. before *t d*, as no other case seems to occur). In this position IE. $\widehat{k}s$ $\widehat{g}z$ did not become Sk. $k\underset{.}{s}$ because the *s z* dropped out before the preceding IE. palatals had lost their palatal value. Thus IE. $\widehat{k}st >$ Ar. $k'st > k't$ and IE. $\widehat{g}zd >$ Ar. $g'zd > g'd$. Cf., for the law of dropping sibilants between stops in Sanskrit, Brugmann, Gr. I², § 828 (who, however, does not draw the necessary conclusions about the cases involving IE. palatals). This process is decidedly natural for a language with weak breath stress, where a sibilant between stops is at best weakly pronounced. In the case of the voiced combination we need only remember that the Sanskrit nowhere pronounced a voiced sibilant. The early date of this law appears in the treatment of *rapš'á-tē* $< $ **raxp-s$\widehat{k}$e-* : here the *s* dropped out before the general pronunciation of $\widehat{k}$ and its pronunciation in the combination *s$\widehat{k}$* had diverged: i. e. before the former had lost its stop value.

The word *pṛcchá-ti* (§ 9) may also be an illustration of this law, unless, like Lat. *posco*, we suppose it earlier to have dropped the first $\widehat{k}$.

12. To return to Sk. $k\underset{.}{s}$. When Sanskrit reduced its final consonant groups to simple consonants, final *-k$\underset{.}{s}$* had to become *-k*.

It is natural, however, that during the operation of the law spoken of in § 11 even final IE. *-$\widehat{k}$s* was affected when it came before stops. Thus **rāk'ṣ tatra* was spoken **rāk' tatra*. Such forms as **rāk'* survived and were spoken alongside the forms in *-k $< $ -k$\underset{.}{s}$*, competing with them, as we shall see, at some advantage.

In historic times forms with final *-k $< $* IE. palatal were used as follows,— *-k'* having everywhere else superseded *-k* :—exclu-

sively in the roots and root-stems *diš'-, dršʼ-, spršʼ-, ruj-,*[1] *dih-;*[2] in the stems *ūrj-,*[3] *bhiṣáj-,*[4] *ṛtvij-;*[5] optionally in the root *naš'* ' attain '.[6]

Sporadic instances of forms with final *-k,* where *-kʼ* has generally been adopted, are the following : (RV. :) *anák* (stem *anákṣ-,* cf. *náš'a-ti*), *ámyak* (root *myakṣ-,* cf. *miš'rá-s*) ; (Vedic:) *prāṇ-adhṛk dadhṛk* (root *dṛṅh-,* cf. Av. *darᵊzayeiti,* Uhlenbeck, l. c., s. v. *dṛhyati*), *puruspṛk* (root *spṛh-,* cf. Av. *sparᵊz-,* Uhlenbeck, l. c., s. v. *spṛhayati*) ; (*Māitrāyaṇī-Saṃhitā:*) *viš'vasrk* (root *sṛj-,* cf. Av. *harᵊzaiti,* Uhlenbeck, l. c., s. v. *sṛjáti*). Here belong finally the Vedic *s*-aorist forms *asrāk* (root *sṛj-*) and *adrāk* (root *dršʼ-*), when used as 2d person sg.

As for the competing forms with *-kʼ,* they will be spoken of below.

13. At the time of the simplification of final consonant groups final *-kʼt* (either < IE. *-k̂t* or < IE. *-k̂st* by the law in § 11) became *-kʼ.* Thus IE. *-k̂t* and *-k̂st* always gave *-kʼ* and IE. *-k̂s* sometimes gave *-kʼ,* sometimes *-k.*

14. At the time of the simplification of final consonant groups IE. *k̂ ĝ* before stops were still uniformly palatal stops *kʼ gʼ.* Breath stress in Sanskrit, we may suppose, was too weak for the formation of a spirant or sibilant glide between stops—cf. the earlier dropping of *s* between stops, § 11.

After the time of the simplification of final consonant groups, however, IE. *k̂ ĝ* before *t d, dh* lost their stop articulation. Concretely expressed: the tongue, instead of passing from a vowel position (1) upward to form a palatal stop (2) and then

[1] The final of *ruj-* is not treated in Sanskrit as an IE. palatal, but, wherever the treatment of the two would necessarily differ, as an Ar. velar. Historically, however, the final of *ruj-* is probably an IE. palatal, cf. Lith. *lúszti, ldužyti,* Russ. *luznut',* mentioned by Uhlenbeck, Et. Wb. d. Ai. Spr., s. v. *rujáti.*

[2] The final of *dih-* is not treated in Sanskrit as an IE. palatal; but cf. Brugmann, Gr. I², § 597, 1.

[3] The final of *ūrj-* is not treated in Sanskrit as an IE. palatal; historically it is considered such by Brugmann, Gr. I², § 608.

[4] The final of *bhiṣáj-* is not treated in Sanskrit as an IE. palatal; historically it falls into this class, cf. Brugmann, Gr. I², § 597, 1.

[5] The final of *ṛtvij-* is not treated in Sanskrit as an IE. palatal; the derivation of the word from the root *yaj-* shows the Sanskrit treatment to be unhistoric.

[6] On the rationale of generalized *k*-forms, cf. Meillet, IF. 18, 418.

(while loosening this) forming with the tip a dental stop (3), took, without change of breath or time used, a simpler course. We must remember in this connection that (as we had occasion to note in § 9) later, in historic times Sanskrit had no strictly palatal stops corresponding to k' or g', but pronounced its "palatals" with the blade rather than the middle of the tongue. So here, the tongue, instead of forming (2) passed more directly from (1) to (3), only approximating (2) in a position (2a). This approximation (2a) produced in the voiceless group a sibilant sound, *š* or *ṣ*. In the utterance of the voiced group, however, there was not breath enough passing through the mouth to make (2a) audible as a spirant or sibilant—(the Sanskrit could not pronounce a voiced sibilant):—(2a) formed simply a prolongation of the vowel ("compensatory lengthening").[1] In these cases the dentals (3) were pronounced farther back in the mouth than usual, becoming (as the Sanskrit made this distinction) "linguals", not dentals. That is : -*ik'ta*- $>$ -*iṣṭa*- but -*ig'da*- $>$ -*i* ... [*ž*] ... *ḍa*- $>$ -*īḍa*-. The change of $a > \bar{o}$ before dropped $\widehat{g}$ is similar to that before dropped Ar. *ḥ* in saṃdhi, as in *yŏ́ dā́mē* $<$ Ar. **yaḥ dam*- (instead of phonetic **yaz d-*). In both cases the $\bar{o}$ is due to the quality of *aḥ* and a + spirant-position. The change to $\bar{e}$ instead of $\bar{o}$ in *ā-mrḗḍayati tṛṇḗḍhi* is probably due to the preceding r (*rṇ*) sound : here a had a value nearer e, as also before Ar. z, cf. Sk. *sēdyā́-t* (Av. *hazdyā-t*). Cf. Brugmann, Gr. I[2], §§ 830, 8, a. 1005, 5.

A possible case of IE. $\widehat{k}q$ later $k'k$ shows the same treatment of k' as before dental, namely *š'ikṣa-ti* $<$ **š'iṣkṣa-ti* $<$ **k̑i-k̑q-se*-; cf. above, footnote ; Brugmann, Gr. I[2], §§ 615, 2. 829, Anm. 1 ; Whitney, l. c., §§ 1030, a. 1040.

Examples of the above change :

(h) Sk. *ṣṭ* ($<$ IE. $\widehat{k}t$): *vā́ṣṭi* (Gr. ἑκών).

($<$ IE. $\widehat{k}st$): *cáṣṭē* ($<$ IE. **q̑ek̑s*-).

(i) Sk. —*ḍ* ($<$ IE. $\widehat{g}d$): *mṛḍīká-m* (*r* long in RV.,
 $<$ IE. **mṛ̥-g̑d*-).

($<$ IE. $\widehat{g}zd$): *ṣŏḍaš'a* ($<$ IE. -$\widehat{g}z$-*de*-).

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[1] As to the inability of the Sanskrit to pronounce voiced sibilants, cf., aside from the historic state of the language, the treatment of IE. z (about which some comment will be made below), and the retention of the sibilant in Ar. *sk'* (Sk. *vṛṣ'cáti*), but not in Ar. *zg'* (Sk. *májjati*).

(j) Sk. — $ḍh$ (< IE. $\widehat{g}dh$): $ūḍhá$-s (< IE. *$\underset{o}{u}e\widehat{g}h$ + to-).
(< IE. $gzdh$): $ṣōḍhā́$ (< IE. *-gz-dh-).

15. In the position before dentals the IE. palatals have thus coincided in Sanskrit with Ar. $š$ $ž$ (< IE. s z after $ĭ$, $ŭ$, $ṛ$, r), as in $tíṣṭha$-ti and $mīḍhá$-m (Av. $miždə$-m).

16. We have now considered the development of the IE. palatals in the following positions:

(1) before vowels, semivowels, nasals, and r, to $š'$ j h $(c)ch$ (§9);
(2) before preserved sibilants, to k, giving $kṣ$ (§ 10);

(2a) final -$kṣ$ becoming -k (§ 12),
(2b) or, before initial stops, -k' (§§ 11, 12);

(3) before dental stops (or sibilants + dental stops), to k' g', giving $k't$ $g'd(h)$ (§ 11);

(3a) final -$k't$ becoming -k' (§§ 11, 13),
(3b) $k't$ and $g'd(h)$ otherwise becoming $ṣṭ$ and —$ḍ(h)$ (§ 14).

(4) before velars the treatment of palatals was probably the same as before dentals (§ 14).

17. Before labial stops, where palatals were followed by closure of the lips, inaction of the tongue, and stoppage of the breath current, these sounds suffered no change, but remained as k' g', the former coinciding with the -k' of § 12 and of § 13. Hence we may say that in all these cases the Sanskrit retained the IE. palatals until a late prehistoric time at a stage which, so far, we have represented by k' g'—meaning thereby to indicate stopped consonants articulated with the "middle part" of the tongue (*Zungenrücken*) against a point of the palate forward of the k g point, and pronounced without spirant vanish.[1]

[1] By this time, needless to say, Sk. c and j from whatever source had become t' d',—stops with a spiran glide, formed very near the "dental" points of tongue and palate.

In historic Sanskrit these k' g' sounds are uniformly represented by the so-called "cerebrals" or "linguals" written $ṭ$ $ḍ$. Whitney, l. c., § 45, says: "The lingual mutes are by all native authorities defined as uttered with the tip of the tongue turned up and drawn back into the dome of the palate (somewhat as the usual English smooth r is pronounced"). They are (§ 46) "perhaps derived from the aboriginal languages of India".

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We have here most probably a case of sound substitution. It is easy to see how a people unaccustomed to hearing correctly or articulating sounds formed with the middle tongue against the dome of the palate, would substitute "linguals" for these sounds. The difference in the place of articulation would be slight if any ; the change would be only in the manner: instead of bringing the dorsal surface of the tongue against the palate, the Hindu articulated with the tip.   Examples :

(k) Sk. $ṭ$ ($<$ IE. $\hat{k}$) : *viṭ-páti-ṣ* (historic form, beside
viš'-páti-ṣ).
($<$ IE. -$\hat{k}s$): *ráṭ tatra* ($< *r\bar{e}\hat{k}s\ t$-).
($<$ IE. -$\hat{k}st$): *aváṭ* (= *a-vākṣīt* Lat. *vexit*,
formed without the connecting *ĭ*).
($<$ IE. $\hat{k}t$): *ánaṭ* (root *naš'*- + *t*).
(l) Sk. $ḍ$ ($<$ IE. $\hat{g}$) *viḍbhyás* (dat. abl. pl. of *viš'*-, GAv.
vīžⁱbyō).

18. The occurrence of $ṭ$ $ḍ$ for older k' g' ($< \hat{k}$ $\hat{g}$) is strictly phonetic, then, (1) before labials (2) finally where a following -*t* or -*št* have been dropped, and (3) finally where a following -*š* has been dropped before initial stops.   Accordingly we should inflect as follows, e. g., the noun stem *viš'*- (IE. *u̯i̯ḱ*- Av. *vīs*-) :

Nom. sg.   *viṭ* (before stops, otherwise :) **vik*,
loc. pl.   *vikṣú*,
bh- cases   *viḍbhyám, viḍbhíš, viḍbhyás,*
other cases *viš'am, viš'ā́, viš'í,* etc.

Most noun stems ending in IE. palatals differ from *viš'*- in forming the loc. pl. with analogic $ṭ$ for *k*, e. g., -*liṭsu* from -*lih*-. In the later language *viṭsu* is the loc. pl. of *viš'*- : the long survival of the phonetic *vikṣú* being due probably to frequency of use.   The complete victory of -$ṭ$ over -*k* in the nom. sg. is due mostly to the analogy of the *bh*-cases, though the occurrence of -$ṭ$ before initial stops no doubt gave the start.   A few isolated and rare -*k* forms are quoted in § 12, end : these sporadic survivals in the literature may well be the reflex of a usage common in the spoken language.   The forms *šáṭ* and *šaṭsú* of the numeral *ša(k)š*- also show victory of the -$ṭ$ form.

On the other hand, the nouns named in § 12 as having -*k* in the nom. sg. have extended this sound to exclusive use.   They

also have retained, like *viš'-*, the *k*-form in the loc. pl. On the basis of these two forms they have then substituted velar forms for the *ḍ* of the *bh*-cases, e. g. *dr̥gbhiṣ*. In the case of the radical noun from the root *ruj*- and of the other nouns in *-j* ($<$ IE. *g*) mentioned in § 12, this process left no distinction between these nouns and the nouns in *-j* ($<$ IE. *g*, *gᵘ̯*)—whose influence of course came into play in all these cases.

In verb forms the peculiar combinations made by IE. palatals plus dental endings have helped to keep the roots in IE. palatals distinct. The roots *ruj*- and *dih*-, however, which are treated as if their finals represented IE. velars or labiovelars, are probably the victims of analogic transference, cf. the notes in § 12. On the other hand the root *bhrajj*- is treated (in its few forms, e. g., pple. *bhr̥ṣṭá-s*) as if its final were an IE. palatal; its cognates however show plainly that its final is not of this class: e. g., CSl. *obrŭzg-nǫti*, cf. Uhlenbeck, l. c., s. v. *bhr̥jjáti*. Note also such formations as *mūḍhá-* for *mugdhá-* and finally the transference to palatal conjugation of the root *ruh*- with IE. *-dh*.

Single verb forms with *-ṭ* for *-k* or *vice versa* are also found. Thus the root aorist and *s*-aorist of roots in IE. palatals ought to form the 2d person sg. in *-k* or *-ṭ* ($<$ older *-kṣ* or *-k̑ṣ* before stops) and the 3d person sg. in *-ṭ* ($<$ older *-k̑t* or *-k̑ṣt*). As a matter of fact the *-k* forms quoted in §12, end, (*adrāk, asrāk*) with *nak* (from *naš'*- 'attain') and *rōk* (from *ruj*-) and the *-ṭ* forms *ánaṭ* (*naš'* 'attain'), *aprāṭ, abhrāṭ, ayāṭ, asrāṭ* are used indifferently for the two persons. The forms *ayās* and *srās* occur twice each for the 2d person sg.; the latter form is explained by Bartholomae as belonging to a 3d sg. **srāt* with *-t* for *-ṭ* through dissimilation by the preceding *r*. *Ayās* is probably quite unphonetic: the analogic relationship is well explained by Whitney, l. c., § 555, a.

Such forms as *uḍḍhi* for **ūḍhi* ($<$ **ug̑-dhi*), imperative of *vaš'*-, are formed on the model of *dug-dhi* and the like, with the feeling that *-š'* before *-dh* as before *-bh* ought to give *-ḍ*. *ṣaḍ-ḍhā ṣaḍ-dhā* for *ṣōḍhā* ($<$ **-eg̑z-dh-*) are of course of similar origin.

19. To sum up, our theory of the IE. palatals in Sanskrit is as follows. IE. *k̑* etc. are, in accordance with the standard view, which is based on phonetic likelihood, supposed to have been slightly palatalized velar stops.—(1) In Aryan (i. e. before the palatalization of IE. velars and labiovelars and before the subsequent change of IE. *ĕ*, *ŏ* $>$ *ă*) there were two dialects: the

Iranian with strong spirant tendency, which developed IE. $\hat{k}$ etc. so rapidly that the new Ar. palatals could not coincide with them ; and the Indic which spirantized $\hat{k}$ etc. less rapidly, so that, while IE. $\hat{k}$ never coincided with the new Ar. palatals, IE. $\hat{g}$ and $\hat{g}h$ did. Before vowels, semivowels, nasals, and r IE. $\hat{k}$ $\hat{g}$ $\hat{g}h$ became Sanskrit $\acute{s}'$ j h.—Before stops and sibilants they at first remained k' g'. After the dropping of sibilants between stops, $k'\acute{s}$ became Sanskrit $k\dot{s}$.—The simplification of final consonant groups reduced -$k\dot{s}$ to Sanskrit -k and -$k't$ to -k'.—Now $k't$ everywhere became $\check{s}\dot{t}$ and $g'd(h)$ everywhere became —$\dot{d}(h)$.— (2) Finally k' and g' (which now remained only in final position and before labial stops) became $\dot{t}$ and $\dot{d}$.

20. Having constructed our edifice we must now defend it. The two points most liable to objection from the viewpoint of the current theory are above marked as (1) and (2). We shall now consider these points.

21. As to point (1), we must observe that we have determined no anterior limit, chronologically, to the state of things there described. The "dialectic" difference between Iranian and Indic in the treatment of the IE. palatals may date back—and probably does date back—to the time when the IE. dialects first began to diverge in their pronunciation of these sounds.

The objection to (1) then will be: How is it possible that of the Aryan sister languages, which long formed a unit, making in common many changes of pronunciation, flexion, use of forms, vocabulary, etc., one should be a thorough-going *satəm* language, the other far from that and almost a *centum* language?

We may answer that this is not only possible, but that this our view is decidedly in accordance with the results of modern investigation. When we say that Iranian and Indic in common changed IE. $\check{e}$, $\check{o}$ to $\check{a}$, but even before that time—and indeed from the Indo-European time—diverged in the pronunciation of the IE. palatals, we are only implying that two successive sound changes, though in part coinciding as to territory, may be topographically of different extent. Iranian and Indic were mutually intelligible dialects in Aryan times, although the old *centum-satəm* sound change had left some difference between them. So the Italic, for instance, agrees in a number of developments with the Celtic and in a number with the Greek. *A priori* it is, in fact, much more likely that one of the so-called *satəm* languages should differ somewhat from the others in its treatment of the

palatals, than that the eastern languages and the western languages should be cut apart like two halves of a cheese.

Such a division as that between *centum* and *satəm* languages has value only as a description or classification of actual facts. As the Sanskrit does not actually represent the IE. palatals by sibilants, but only partly so and mostly by palatal, velar, and lingual stops, the burden of proof rests entirely on those who wish to class Sanskrit with the sibilant languages and insist that the Sanskrit sibilants are hidden behind the historic Sanskrit stops.

22. This brings us to the second point of objection. We have supposed that in certain positions the IE. palatals remained palatalized velar stops in Indic until shortly before the historic time, when they were changed to the Sanskrit lingual stops. In other words, we assumed a sound substitution $k'\ g' > \d{t}\ \d{d}$ where the current view supposes a development of $k'\ g' > \acute{s}'\ \acute{z}' > \d{t}\ \d{d}$ Aside from the methodic consideration that it is unnecessary to suppose such a roundabout development as the latter, our chief argument was that a development from $\acute{s}'\ \acute{z}'$ to $\d{t}\ \d{d}$, or in general from sibilants to stops is improbable and unparalleled.

The objection may be urged, now, that this development is paralleled in Sanskrit, that the IE. sibilants in Sanskrit sometimes appear as lingual and as dental stops. Let us consider these phenomena and attempt to divine their meaning.[1]

We must note, first, that the actual representation of IE. sibilants and of IE. palatals does in one set of cases universally coincide : namely, the IE. palatals before dental stops coincide with Ar. $\acute{s}\ \acute{z}$ in the same position (cf. § 15).

Secondly we must note that the following representations of IE. sibilants as stops are rare in the older language. If in some cases the analogies involved seem indirect, we must remember that they were not made any oftener than this would lead us to expect. The representations in question become regular only after the grammarians, who naturally were struck by what seemed to them decided and peculiar sound-changes, prescribed them as correct.

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[1] To avoid constant reference to the divergent view we may here refer to Brugmann's Grundriss I², §§ 819–830. 1005, 5. 1007, 11. Examples are taken from Brugmann and from Whitney, l. c., §§ 164–168, b. 172. 172, a. 225–226, f. 612, b. 617, b. 620, b.

Thus when we find a few cases in the older language of $\breve{s}$ before s in inflection " becoming " k, so as to give $k\breve{s}$, the explanation is obvious:—*vā́ṣṭi* : *vā́kṣi* = *viveṣṭi* : *vivékṣi.* Similarly, Vedic 2d and 3d sg. *piṇak* as if from a palatal root.

So obvious is this explanation that even some advocates of the prevalent view have decided to adopt it, although giving up the change $\breve{s} > k$ forces the corollary that IE. $\hat{k}$ $\hat{g}$ before sibilants at least never quite became sibilants, but were " Ar. χ γ ".

The second supposed change of sibilants to stops is that to linguals. Final $-\breve{s}$ (IE. $-s$ $+$ $-s$ of nom. sg. or $-s$, $-t$ as verb endings) appears in a few old cases as $-ṭ$. Later this is considered regular, and the final $-\breve{s}$ of radical noun stems appears as $-ṭ$ $-ḍ$ also before the endings $-su$ and $-bh-$, e. g. *dviṣam*, *dviṭ*, *dviṭsú*, *dviḍbhíṣ*; imperfect tense : *ádveṣam*, *ádveṭ*, *ádveṭ.*

The standard view wisely leaves *dvíṭ*, *ádveṭ* out of play ; *dvíṭsú* is allowed to be unoriginal; but *dviḍbhíṣ* is considered the regular phonetic development of *dviẓ-bhíṣ*. From this *dvíṭ*, etc., developed.

The facts of the language are decidedly against this view. The prefix *duṣ-* nowhere changes its final to a stop, lingual or other ; similarly the adverb *sajū́ṣ.* The change of $-\breve{s}$ to $ṭ$ $ḍ$ occurs " only once in RV. and once in AV. (*-dvíṭ* and *-pruṭ*), although those texts have more than 40 roots with final $-\breve{s}$; in the Brāhmaṇas, moreover, have been noticed further only *-pruṭ* and *viṭ* ŠB.), and $-\breve{s}'liṭ$ (K.) ". On the other hand we still meet in RV. *vivéṣ* and *á-vivéṣ* from *viṣ-* and perhaps a few other cases, cf. Whitney, l. c., §§ 225, a. 226, d. Even in the later language most cases of final $-\breve{s}$ fall into the class of *havíṣ-* (*havir ásti*, *havís tíṣṭhati*, etc., *havírbhíṣ*, *havíṣṣu* or *havíḥṣu*). Our judgment has been too much under the spell of the traditional descriptive grammar, which naturally emphasizes the most striking changes. It was the similarity of *vā́ṣṭi* to *dvéṣṭi* (and later of *vā́kṣi* to *dvékṣi*) that caused *ádveṭ* to be formed like *ávaṭ.* In the case of the nouns the necessity was felt that a root noun, in the nom. sg., before *-bh*, and before *-su*, had to have a stop. Owing to forms like *ádveṭ* the stop thought of was the lingual. Otherwise expressed: as $\breve{s}'$ gave in various connections $\breve{s}ṭ$, $k\breve{s}$, $ṭ$, $ṭs$, $ḍbh$, $\breve{s}$, which also gave $\breve{s}ṭ$ was made to give $k\breve{s}$, and later $ṭ$, $ṭs$, $ḍbh$. Note further such parallels as *lékṣi* with the new *dvékṣi* and *álīḍhvam* with (*s*-aor.) *astōḍhvam.* When the feeling had

arisen that the stop form of $š$ was $ṭ$ $ḍ$, forms like *dviḍḍhi* and forms and spellings like *dviḍḍhvam* arose, cf. *uḍḍhi*, § 18, end, and Brugmann, Gr. I², § 830, Anm. 2.

23. Parallel to forms with $kš$ from roots in -$š$ are a few forms with ts from roots with -s, as fut. *vatsyā́mi* from *vas-*, desid. *jighatsa* from *ghas-*. The regular treatment would have given **vassyā́mi*, etc., or **vahsyā́mi*, etc. (similarly pronounced), which were not felt as *s*-forms; hence imitation of the nearest lying combination of stops + *s*, as in *patsyā́mi*. There is no need of any such far-fetched explanation as change of *s* to *t* before *s*, or development of a stop within *ss*.

Again, parallel to the supposed change of -$š$ to -$ṭ$ -$ḍ$ a change of -s to -d is considered phonetic in the Vedic *mā́dbhiš*, etc., from *mā́s-* and *uṣā́dbhiš* from *uṣás-*; but there is no reason for abandoning Whitney's explanation of these forms as substitution of *t*-stem forms for *s*-stem forms. Whitney adduces the parallel case of the perf. act. pple.; and, in general, inflection from several stems is so characteristic of the older stages of IE. languages that these ancient and rare forms also are best looked upon as survivals. Cf. for the rest Goth. *mēnōps* and the relation Sk. *yákṛt, yakn-ás* : Lat. *jec-in-or-is*.

There is further one word stem in which IE. z is said to have given Sk. d: *madgúš-*, cf. Lat. *mergus*, which belong to Sk. *májja-ti*, Lith. *mazgóti*. First note that the *jj* in *májja-ti* is pronounced $d'd'$ (with a slight glide), cf. $jj < d + j$ in *taj jalam*. This $d'd'$ is, as we have seen, parallel to $(c)ch$ (the first c serves, of course, only to indicate that ch is a *double* consonant, not a mere aspirate), except that in this combination, pronounced $t'š'$, the $š'$ corresponds to the second d' of the voiced combination, where sibilant could not be pronounced. Just as sk' ($= s\widehat{k}$) > $s'k'h > s'k'χ' > š't'š' > t'š'$, so in the voiced combination zg', with slower development, $zg' > z'g'h >$ (some such thing as) $d'y' > d'd'$. Now the noun **mazgu-* regularly > **mēgu-*, for which *madgú-* was formed from *májja-ti* just as *tád gácchati* corresponds to *taj jagā́ma* or, practically, as *tyāgá-s* corresponds to *tyájati*.

Thus it appears that the alleged developments of sibilants to Sanskrit stops are in no case instances of phonetic change.

NOTE *on the IE. " sonant aspirates "*. In the above discussion the treatment of IE. $\bar{g}h$ was brought up as little as possible,

owing to the uncertainty which surrounds the nature of the IE. "sonant aspirates". We shall here recall a few of the properties of these sounds as indicated by their development in the various IE. languages and then show that our view of the development of the IE. palatals in Sanskrit is consistent with the development of IE. $\tilde{g}h$ to voiced *h.*

(1) The stop element in the IE. "voiced aspirates" was voiced, as a preceding voiceless stop is assimilated. The second element or "aspiration" cannot be pronounced before an immediately following stop, but is left until the stop or stops have been articulated, and is then uttered: in the meantime the glottis is not opened, i. e., the voice continues, as in "assimilation" of surds to sonants,—showing the "aspiration" to have been a voiced sound. In Sanskrit when the stop element is absent the sound uttered is a "voiced *h*" (*stimmhafter Hauch*). We may, then, provisionally ascribe to the "sonant aspirates" the value of a stop closely followed by a voiced breathing—a volume of breath being sent through the open mouth sufficient to be audible as an aspiration (*Hauch*), but not sufficient to necessitate greater opening of the glottis than is consistent with voicing.

(2) The inherent difficulty of pronouncing these sounds is due to the general fact that a delicately graded or "halfway" muscular movement is harder to make than a decided or "all the way" one. Hence the instability of these sounds. They are preserved only in the highly conservative and ancient Sanskrit. In Germanic they were preserved up to the time of the sound-shifting, when they were changed by the strong breath stress, which probably assimilated the stop element to the succeeding spirant element. Sanskrit and Germanic alone kept the "sonant aspirates" apart from the other classes of stops.[1]

(3) In Greek and Italic a total opening of the glottis was substituted for the delicately graded opening with voice continuation. Thus the aspiration became voiceless and the stop was assimilated to it. Similar is the result when an English-speaking person first tries to pronounce a "sonant aspirate" as above described, or a Čechish voiced *h.*

(4) The other IE. languages substituted ordinary vibration of the vocal chords for the period of more open vibration: or, from

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[1] This conservative phonetic character of Germanic among the IE. languages is general, cf. a forthcoming paper by Dr. E. Prokosch.

another point of view, they assimilated the voiced aspiration to the following action of the vocal chords.

(5) The difficulty of pronouncing these sounds affects even Sanskrit. In the passage from vowel to stop to " breathing " the (lip or) tongue had to make its stop articulation rapidly : and this rapid action had to be made most rapidly exactly where it is most difficult, in the back of the mouth. Hence we find h for bh less frequently than h for dh ; and, could we distinguish the cases of h for gh from those of h for (historic or analogic) $g'h$, there is no doubt that we should find them more numerous than the preceding. In the case of $g'h$ ($<$ IE. $\widehat{g}h$ and Ar. $g'h$) the difficulty of pronunciation was by far greatest, as the middle tongue had to be raised to the highest part of the palate—an articulation nowhere retained in Sanskrit. Hence we find here universal loss of the stop and retention of voiced h.

LEONARD BLOOMFIELD.